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Snowflake divertor configuration studies for NSTX-Upgrade V.A. SOUKHANOVSKII, LLNL, S.P. GERHARDT, R. KAITA, E. KOLEMEN, H.W. KUGEL, J.E. MENARD, PPPL, R. MAINGI, A. MCLEAN, ORNL, AND NSTX RESEARCH TEAM — The snowflake divertor configuration is being considered as the divertor solution for high-power density operation in NSTX-Upgrade, where peak divertor heat loads are predicted to be $q_{peak} = 20-30$ MW m^{-2}. Recent experiments in NSTX demonstrated the potential for the snowflake divertor configuration not only to reduce steady-state divertor peak heat flux from 4-8 to 0.5-1 MW m^{-2} (with 4 MW NBI heating), but also to reduce impulsive heat loads due to Type I ELMs to acceptable levels simultaneously with overall good H-mode confinement properties. The reduction of heat flux is attributed to the snowflake geometry effects that led to a reduced $q_{\|}$ due to increased radiative losses and radial heat diffusion, and a reduced q_{div} due to the increased plasma-wetted area. Experiments are being planned to study the snowflake divertor power accountability, pumping with solid lithium coatings, impurity production, effects of applied resonant magnetic perturbations and additional gas puffing, plasma shaping and magnetic control to enable the assessment of its operating space and projections to NSTX-Upgrade. Supported by the U.S. DOE under Contracts DE-AC52-07NA27344, DE-AC02-09CH11466, DE-AC05-00OR22725.

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